

REMARKS

Very thanks for Examination's suggestion and thanks for finding some citations about the present invention, thereby, the applicant may know more information about the invention. This case has been carefully reviewed and analyzed in view of the office action. All details of the reference prior arts are fully considered and compared with the present invention.

Responsive to the objections and rejections made of the Examiner in office action. We have amended the specification, claims and abstracts. All the errors disclosed in that office action has been corrected according to the Examiner's indications disclosed in the official action.

Indeed the citations disclose some features of the present invention, and the applicant agrees with these viewpoints, however applicant discovers that some main features of the present invention is not disclosed in the citation which can form the novelty and inventive step of the present invention.

To illustrate the novelty of the present invention and overcome the objection from the citations, the applicant decides to cancel Claims 1 to 5, without prejudice or disclaimer of the subject matter thereof, and add new claims 6 to 8. The added new claim 6 is based on the original claims 1, 2, 3 and the section in the second paragraph of page 5 of the specification. The new claims 7 and 8 add features same as the original claim 4, and 5, respectively, to the new claims 6. Thereby, it is assured that the new claims are based on the original claim and specification and thus no new matter is added. The relation of the new claims with respect to the original claims are shown in the following REMARK, Examiners can read the claims more easily from the REMARK.

Claim 6 (New) ~~4.~~ A combining device capable of being embedded into an embedded object comprising:

an embedding unit 100 having a first end 110 to be embedded into an embedded object and a second end 120 having an elastic buckling means 140;

a hollow coupling unit 200 having an inner surface which is formed as a channel 220;

wherein in assembly, the second end 120 of the embedding unit 100 is combined with a load and then the elastic buckling means 140 is inserted into the channel 220 of the hollow coupling unit 200 so that the embedding unit 100 is tightly engaged with the hollow coupling unit 200; and the first end 110 is received in the embedded object so that the embedded object ~~bearing~~loading the weight of the load.

~~2. The combining device capable of being embedded into an embedded object as claimed in claim 1, further comprising a sliding sleeve 300 for enclosing the second end 120 of the embedding unit 200 to reduce the friction force between the embedding unit 100 and the hollow coupling unit 200 as the second end 120 of the embedding unit 200 is received in the hollow coupling unit.~~

(from the second paragraph of page 5 of the specification)wherein a middle section of the sliding sleeve has a plurality of longitudinal outer cambered strips 301; the sliding sleeve is made of metal and is slightly elastic for enclosing the elastic buckling means; the strips are concave outwards so that when the embedding unit inserts into the hollow coupling unit.

~~3. The combining device capable of being embedded into an~~

~~embedded object as claimed in claim 1,~~ wherein an outer surface of the first end 110 of the embedding unit 100 is formed with a plurality of tapered rings 130; each tapered ring 130 has a plane portion vertical ~~vertically~~ to the outer surface of the first end 110, an annular surface parallel towards a ~~to the~~ bottom thereof and a tapered surface extending ~~extends~~ from the annular surface to the outer surface of the first end; a narrow part of the tapered ring is further away from the second end than the bottom thereof;

wherein in combining, the annular surface of each tapered ring tightly engages to the embedded object for providing a reactive ~~react~~ force to support an heavy object.

Claim 7 (New) ~~4~~ The combining device capable of being embedded into an object as claimed in claim 6 ~~4~~, wherein the second end comprises ~~is~~ a biforked elastic buckling posts 151 which are arranged oppositely; a front end of each buckling post has a hook; when the embedding unit is inserted into the hollow coupling unit, ~~the~~ the hook of the buckling post will be buckled in the channel of the hollow coupling unit.

Claim 8 (New) ~~5~~ The combining device capable of being embedded into an object as claimed in claim 6 ~~4~~, wherein the second end is formed by four elastic buckling posts which are arranged oppositely; a front end of each buckling post has a hook; when the embedding unit is inserted into the hollow coupling unit, ~~the~~ the hook of the buckling post will be buckled in the channel of the hollow coupling unit.

(A) For the citation USP 573,970

The feature of the new claim 6 is to add a new features of "a middle section of the sliding sleeve has a plurality of longitudinal outer cambered strips 301; the sliding sleeve is made of metal and is slightly elastic for

enclosing the elastic buckling means; the strips are concave outwards so that when the embedding unit inserts into the hollow coupling unit.” to the citation.

The citation '970 has the feature of embedding unit (E) and hollow coupling unit (G), second end (F) as that of the present invention, but it has no the features of the sliding sleeve 300 and cambered strip 301 of the present invention.

(B) For the citation USP 2,470,924

The citation '924 has the features of elastic buckling means (9, 11, 12), the embedding unit (1), first end (8, 13) of the present invention, but it has no the features of the sliding sleeve 300 and cambered strip 301 and the hollow coupling unit 200 of the present invention.

(C) For the citation USP 4,681,477, US-5,131,783, US6,176,662, US2,279,956, US3,883,258, US3,349,649, etc.

These citations are about the tapered rings which are also disclosed in the new claim 6 of the present invention, but the tapered rings are not singly as a feature of the present invention. The tapered rings are formed on the outer surface of the first end so as to tightly engage to the embedded object for providing a reactive force to support a heavy object. Thereby the tapered rings 130 and the cambered strips 301 provide a combinational effect for engaging an object to the present invention. It cannot be achieved by any one of the citations.

(D) For the citation USP 3,341,487, US-2,100,872, US2,384,918.

Although the above citations, USP 3,341,487, US-2,100,872, US2,384,918. disclosed the slide sleeve (300 of the present invention), but they do not disclose the cambered strips (301 in the present invention). That is: “a middle section of the sliding sleeve has a plurality of longitudinal outer cambered strips 301; the sliding sleeve is made of metal and is slightly elastic for enclosing the elastic buckling means; the strips are concave outwards so that when the embedding unit inserts into the hollow coupling unit.” to the citation.” Thus the slide sleeves in the citations are not same as the slide sleeves defined in the new claim 6 of the present invention.

(E) For the combination of all the above mentioned citations USP 573,970, USP 2,470,924, USP 4,681,477, US-5,131,783, US6,176,662, US2,279,956, US3,883,258, US3,349,649, USP 3,341,487, US-2,100,872, US2,384,918.

From above discussion, it is known that the combination of all the citations cannot have the feature of the cambered strips 301.

Although other features can be seen in the other citations, from the office action, it is known that the present invention combines the features in various citation so as to form a powerful combining device, which cannot be achieved by any of the citations. Although the citations USP 573,970 and USP 2,470,924 has similar usage as the present invention, but they cannot achieve the same effect of the present invention. The present invention combine many features so as to provide a power device. This make the present invention being novel.

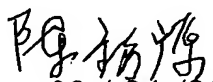
(E) RESULT

Since in above discussion, it is apparent that no prior art has the features of the present invention, especially in new claim 6. Furthermore, as we know that no other prior art has features of the present invention. Thus, the present invention is novel and inventive.

If there is any error in the specification, or claims, applicant requests and authorizes Examiner to amend the claims, specification and drawings of the present invention so that they can match the requirement of U. S. Patent. Attentions of Examiner to this matter are greatly appreciated.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectively requested.

Respectfully submitted.


Dated: 03 / 24 / 2004

235 Chung – Ho Box 8-24

Taipei Taiwan R. O. C.

“MARK-UP” COPY OF THE AMENDED SPECIFICATION

COMBINING DEVICE FOR SUSPENDING OBJECT

FIELD OF THE INVENTION

The present invention relates to retaining devices, and particular to a combining device capable of being embedded into an object. The combining device mainly includes an embedding unit capable of embedding into a retaining side and a hollow coupling unit. A heavy object can be suspended between the embedding unit and the hollow coupling unit.

BACKGROUND OF THE INVENTION

In the prior art, if it is desired to suspend a heavy object on a wall, in general, a hammer serves to nail nails to the wall. Then the heavy objects are suspended on the wall. In another prior art, holes are drilled on the wall first ~~firstly~~, then sleeves are embedded into the wall. Then steel nails or threaded nails are nailed into the sleeves for suspending heavy objects. Theses methods ~~ways~~ are generally used in lamps, ceiling lamps, suspending fans, cabinets, etc.

These conventional ways for suspending or retaining heavy objects have the following defects. First ~~Firstly~~, it is often that many places are not allowed to nail nails or the places are difficult in work. The process of nailing will hurt the worker. The mails cannot be embedded deeply so that the supporting force is insufficient. It is difficult to detach the nails or as the nails are detached, the surface of the wall is destroyed.

SUMMARY OF THE INVENTION

Accordingly, the primary object of the present invention is to provide a separable auxiliary device of a milk absorber, wherein the combining device mainly includes an embedding unit capable of embedding into a

retaining side and a hollow coupling unit. A heavy object can be suspended between the embedding unit and the hollow coupling unit.

To achieve above objects, the present invention provides a combining device capable of being embedded into an object comprising: an embedding unit having a first end to be embedded into an embedded object and a second end having an elastic buckling means; a hollow coupling unit having an inner surface which is formed as a channel; wherein in assembly, the second end of the embedding unit is combined with a load and then the elastic buckling means is inserted into the channel of the hollow coupling unit so that the embedding unit is tightly engaged with the hollow coupling unit; and the first end is received in the embedded object so that the embedded object bears ~~loading~~ the weight of the load.

The combining unit device capable of being embedded into an object further comprises a sliding sleeve for enclosing the second end of the embedding unit for reducing the friction force between the embedding unit and the hollow coupling unit as the second end of the embedding unit is received in the hollow coupling unit.

An outer surface of the first end of the embedding unit is formed with a plurality of tapered rings; each tapered ring has a plane portion vertically to the outer surface of the first end, an annular surface parallel to the bottom thereof and a tapered surface extends from the annular surface to the outer surface of the first end; a narrow part of the tapered ring is further away from the second end than the bottom thereof; wherein in combining, annular surface of each tapered ring tightly engages to the embedded object for providing a reactive ~~react~~ force to support an heavy object.

The second end comprises ~~is a~~ biforked elastic buckling posts which are arranged oppositely; a front end of each buckling post has a hook; when the embedding unit is inserted into the hollow coupling unit; the hook of the buckling post will be buckled in the channel of the hollow coupling unit.

Furthermore, in another application of the present invention, the second end is formed by four elastic buckling posts which are arranged oppositely; a front end of each buckling post has a hook; when the embedding unit is inserted into the hollow coupling unit; the hook of the buckling post will be buckled in the channel of the hollow coupling unit.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

Brief Description of the Drawings

Fig. 1 is a front view of the preferred embodiment of the present invention.

Fig. 2 is an exploded perspective view and an assembled cross section view of the present invention.

~~Figs. Fig.~~ 3a and 3b are schematic view of two preferred embodiments ~~embodiment~~ of the present invention.

Fig. 4 is a schematic perspective view showing one preferred embodiment, where an embedding unit is enclosed by a sliding sleeve.

~~Figs. Fig.~~ 5a to 5c are schematic perspective view showing that the present invention is installed to a furniture, and the embedding unit is buckled to a hollow coupling unit.

Detailed Description of the Invention

In order that those skilled in the art can further understand the present invention, a description will be described in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the scope and spirit of the present invention defined in the appended claims.

With reference to Fig. 1, a front view of a preferred embodiment of the

present invention is illustrated. The combining device of the present invention includes an embedding unit 100, a hollow coupling unit 200, a first end 110 at one end of the embedding unit 100; a second end 120 at another end of the embedding unit 100; at least one first tapered ring 130 along an outer surface of the embedding unit 100 for enhancing the retaining force as the embedding unit 100 ~~is being~~ retained (in the drawing, several rings 130 are illustrated); an elastic buckling means 140 protruded from the embedding unit 100 for buckling with the hollow coupling unit 200; and at least one reversed tapered rings 210 along an outer surface of the hollow coupling unit 200 for suspending a heavy object on the hollow coupling unit 200.

With reference to Fig. 2, in this drawings, elements having same functions and arrangement are numerated with same numbers. The at least one tapered rings 130 are around the embedding unit 100. In the cross section view of Fig. 2, each tapered ring is formed as a bottom end of an isosceles triangular. A bottom end of each isosceles triangular as the plane 131 is vertically connected to the axis of the embedding unit 100. The plane 131 is adjacent to an inclined surface 142. Therefore, when the embedding unit 100 is installed to a furniture, a wall or any object capable of receiving the embedding unit 100, the tapered rings 30 resist ~~resists~~ against the furniture, wall or the object by the plane 131 so as to provide an reactive force to support the heavy object. The second end 120 of the embedding unit 100 has the elastic buckling means 140. In Fig. 2, the elastic buckling means 140 is formed as a biforked buckling means 150 which includes two buckling posts 151 having the same form, but having different elastic orientations. In practical, a front end 141 of the elastic buckling means 140 has a larger diameter so as to form an elastic hook 142, and a vertical recess 143 is formed to cut across the cross section of the elastic buckling means 140, while the opening of the vertical recess 143 is at the elastic hook 142. An outer corner 144 of the front end 141 is chamfered, and the two buckling posts 151 can expand

outwards.

The outer surface of the hollow coupling unit 200 has reverse tapered rings 210. Each tapered ring 210 is symmetrical at two sides and has a tapered isosceles triangular shape. Each ring 210 includes a plane 211 and an adjacent inclined surface 212. The orientation of the inclined surface 212 is reverse to that of the inclined surface 142 of the tapered ring 130 of the embedding unit 100. Thereby, objects can be easily suspended from the plane 211 of the tapered ring 210. A center of the hollow coupling unit 200 is formed with a channel 220. The channel 220 is formed by a first channel 221 and a second channel 222. The elastic buckling means 140 (including the front end 141) fits exactly ~~exactly inserts~~ into the first channel 221. The second channel 222 of the channel 220 is slightly wider than the first channel 221. The first channel 221 is communicated to the second channel 222. The connection of the of the first channel 221 and the second channel 222 is formed with a rectangular buckle 223 corresponding to the elastic hook 142 of the front end 141 of the elastic buckling means 140. When the elastic buckling means 140 is pushed to resist against the rectangular buckle 223, the buckling posts 151 will be released so as to expand outwards. Then the hook 142 will be pushed and then buckled to the buckle 223.

Figs. 3a, 3b and 4, a sliding sleeve 300 is capable of enclosing the elastic buckling means 140 of the embedding unit 100. A middle section of the sliding sleeve 300 has a plurality of longitudinal outer cambered strips. Preferably, the sliding sleeve 300 is made of metal and is slightly elastic for enclosing the elastic buckling means 140. The strips 301 are concave outwards. When the sliding sleeve 300 encloses the elastic buckling means 140, the strips are concave outwards (referring to Fig. 4) so that when the embedding unit 100 inserts into the hollow coupling unit 200, the sliding sleeve 300 and the strips 301 have the effect of reducing the friction force between the embedding unit 100 and the hollow coupling unit 200 and increase the tightness therebetween. With reference to Fig.

3a, the elastic buckling means 140 of the embedding unit 100 is a biforked buckling means with two buckling posts 151, while in Fig. 3b, elastic buckling means 140 is divided into four parts. The outer surfaces of the embedding unit 100 and the hollow coupling unit 200 are installed with a plurality of indentations 101, 201 which can increase the contact area and the friction force of the embedding unit 100 and hollow coupling unit 200.

With reference to Figs. 5a and 5c, in these drawings, the same elements like the former examples are numerated with the same numbers. Fig. 5a shows one furniture 500 for receiving the embedding unit 100 of the present invention. The furniture 500 has an opening 501. In assembling the combining unit 10, the sliding sleeve 300 encloses the embedding unit 100 (referring to Fig. 4), then the first end 110 of the embedding unit 100 having the tapered rings 130 are aligned to the opening 501 of the ~~furniture embedded object~~ 500.

In Fig. 5b, the first end 110 of the embedding unit 100 having the tapered ring 130 inserts into the opening 501 of the embedded object 500 by any way, for example, gluing. The embedding unit 100 is combined with the embedded object 500. Thereby, the assembly of the combining unit 10 is complete. Then the hollow coupling unit 200 inserts into the embedding unit 100.

Fig. 5c, the combining unit 10 can be loaded with a heavy object 600. The hollow coupling unit 200 is tightly combined with the embedding unit 100. The heavy object is clamped ~~thereof~~ so that the weight of the heavy object is supported by the embedded object 500.

The present invention is thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

ABSTRACT

A combining device capable of being embedded into an object comprises: an embedding unit having a first end to be embedded into an embedded object and a second end having an elastic buckling means; a hollow coupling unit having an inner surface which is formed as a channel; wherein in assembly, the second end of the embedding unit is combined with a load and then the elastic buckling means is inserted into the channel of the hollow coupling unit so that the embedding unit is tightly engaged with the hollow coupling unit; and the first end is received in the embedded object so that the embedded object loading the weight of the load.